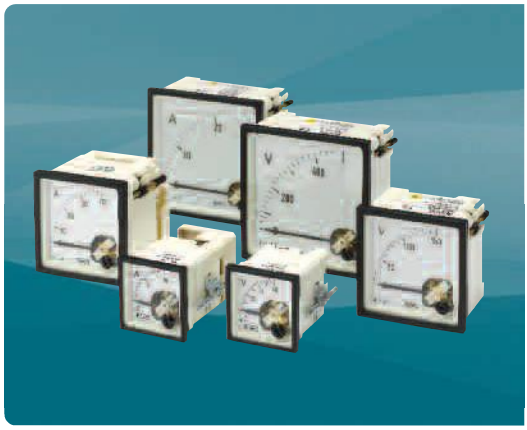
Crompton Instruments Analogue Meters

TE connectivity ENERGY

Analogue Instruments



High quality analogue instruments designed to measure an extensive range of electrical and electronic parameters. This comprehensive range offers DIN instruments, ANSI switchboard meters, panel indicators, sealed and ruggedised instruments, and complementary selector switches for line-to-line and line-to-neutral readings. Instruments are precision engineered and robust in design, ensuring accurate measurement and display in the most demanding of environments. All instruments are available in a range of styles, sizes and specifications to meet the exacting needs of your industry.

Contents

Features
- Extensive range
- Accurate measurement and display of electrical and electronic parameters
- Wide range of case styles and specifications
- Maximum reliability in harsh environments

Benefits
- Low cost
- Local indication
- Ease of installation
- Minimal training
- Low maintenance
- Reasonable accuracy

Applications
- Switchgear
- Distribution systems
- Generator sets
- Control panels
- Energy management
- Building management
- Utility power monitoring
- Process control
- Motor control

Approvals
- UL, CSA, ABS, LRS, BV, ISSeP

Features
- A range of the most popular short-scale measuring instruments in 4 case sizes
- Shock resistant sprung pivot and jewel movement
- Terminal covers supplied as standard
- EMC hard frequency meter are fully EMC and LVD compliant
- ¼" 'fast on' terminals available

Benefits
- Low cost
- Local indication
- Ease of installation
- Minimal training
- Low maintenance
- Customised options and features

Applications
- Switchgear
- Distribution systems
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- Control panels
- Energy management
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- Utility power monitoring
- Process control
- Motor control

Approvals
- Lloyds:
- 03/00055 - Moving coil meters
- 03/00056 - Moving iron meters
- 03/00057 - Frequency meters

DIN Panel Meters – Short scale

A range of 48, 72, 96 and 144mm DIN style panel meters measuring all electrical parameters and featuring moving coil or moving iron movements. All meters incorporate slide-in dials and terminal covers as standard. A range of customised options is available.

Movements

Moving Coil Meter
Centre cored, self shielding moving coil movement, using pivots, hairsprings and sprung jewels. Seven variations have been designed in movement ranges: all intermediate ranges are achieved by shunting the next lowest range. All DC voltmeters are 1000 ohms per volt, rectified product run at 900 ohms per volt, millivolt meters use the 5 milliamp movement.

Moving Iron Meter
Clapper type repulsion design using pivots, hairsprings and jewel movements. The bottom jewel is oil filled to provide damping while the top is sprung for resilience. All voltmeters are manufactured with external voltage dropper resistors to substantially reduce the self heating effects.

Frequency Meter
Meter uses a 100 microamp 4000 ohm movement driven by an EMC hard frequency conversion circuit.

Dials, Scales and Pointers
Standard dials are white matte with black printed scales and bar knife-edge pointers. Black dials with white or yellow scales and pointers are also available. Interchangeable slide-in dials are used on the E242, E243, E244 and E246 90° moving iron, moving coil and frequency meter models.

General options include red supplementary pointers, red indexes (quadrant scales), red, green or blue lines, bands or segments, finely spaced divisions, multi-scales, special scales and captions to customer's requirements.

Specifications

Type of Instrument	Moving iron for current and voltage	Moving coil for current and voltage	Moving coil with rectifiers for current and voltage	Moving coil with built-in transducer for frequency measurement	Maximum demand indicators	Combined MDI with moving iron movement
Format	48 x 48mm 72 x 72mm 96 x 96mm 144 x 144mm	48 x 48mm 72 x 72mm 96 x 96mm 144 x 144mm	48 x 48mm 72 x 72mm 96 x 96mm 144 x 144mm	72 x 72mm 96 x 96mm 144 x 144mm	72 x 72mm 96 x 96mm	96 x 96mm
Movement Type	Sprung pivot jewel with silicon oil damping	Sprung pivot jewel with eddy current damping	Sprung pivot jewel with eddy current damping	Sprung pivot jewel with eddy current damping	Sprung pivot jewel with silicon oil damping	Sprung pivot jewel with silicon oil damping
Burden	0.5VA-15A then 0.8VA voltmeters 4.5VA	See detailed specifications	See detailed specifications	See detailed specifications	2.5VA	3VA
Accuracy	1.5% to DIN43780	1.5% to DIN43780	2.5% to DIN43780	0.5% to DIN43780	3% on MDI	3% on MDI 1.5% ammeter
Input Type	AC current or voltage	DC current or voltage	AC current or voltage	AC voltage	AC current	AC current
Measuring Range	6-600V 100mA-100A	15mV-600V 25µA-100A	6-600V 100µA-100mA	57.7V @ 45Hz 500V @ 44Hz	1-6A 8, 15 or 20 minute delays	1-6A 8, 15 or 20 minute delays 0-5A/6A instantaneous
Dielecric Voltage Withstand Test	3kV ac	3kV ac	3kV ac	3kV ac	3kV ac	3kV ac

General Specifications

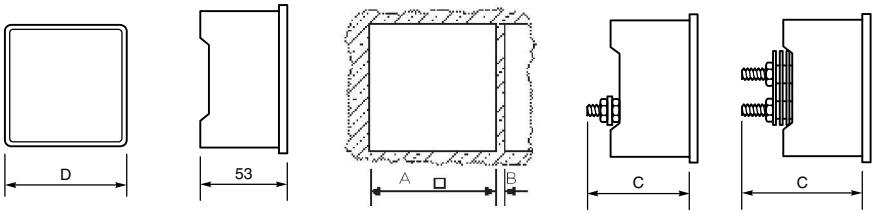
Performance	BSEN60051
Measuring ranges	DIN43701
Accuracy overload	BSEN60051
Dimensions	DIN43700
Scale marking generally to	DIN43802
Magnetic influence	BSEN60051
Safety	BSEN61010-1
Terminals	Clamp strap M4 for up to 25A. Clamp strap M8 for over 25A ¼" spade terminals available for models E243 and E244
Humidity range	Up to 95% RH (non condensing)
Test voltage @50Hz	3kV RMS for 1 minute
Ammeter ranges	1.0/1.2/1.5/2.5/5/6 and decade multiples thereof
Overload AC current	x 1.2 continuous x 10 for 5 seconds
AC voltage and frequency	x 1.2 continuous x 2 for 5 seconds
Standard calibration	23°C. Calibration at other temperatures available on request
Operating temperature	-20°C to +60°C
Damping time	Less than 3 seconds
Enclosure code	IP52 as standard IP54 on request
Case and base	Grade UL94V0
Case	Dimensions and panel cut out conform to IEC473, DIN43700. Case made from glass filled polycarbonate self-extinguishing and non drip in accordance with UL94 V-O
Bezel	Slim-line DIN43802, black as standard
Bezel window	Standard sheet glass, with zero adjusters where appropriate. Non reflecting glass or polycarbonate shatterproof windows are available
Installation	Installations in switchboard panel or mosaic arrangement on equipment or machine with a panel thickness of up to 40mm in a horizontal or vertical plane
Fixing on panel	Swivel captive fasteners, which can be fixed at either corner
Mounting position	Normal vertical mounting or as indicated on the scale in accordance with DIN16257. A deviation of ±15° is permissible
Insulation group	Insulation resistance more than 5MΩ@ 500 V
Environmental	Measurement category III IEC 1010-1 Pollution degree 2 IEC 1010-1 Electrical rating 600V RMS (920V peak)
Approvals	EMC, LVD and Lloyds

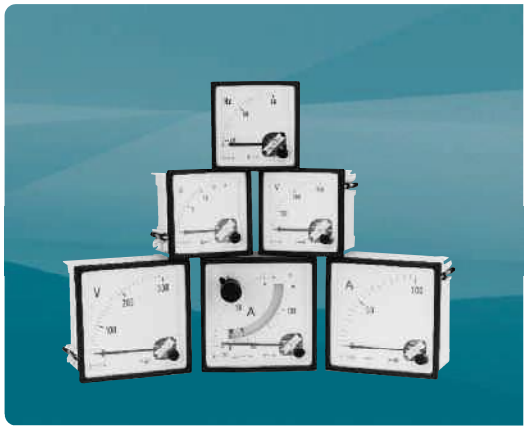
Dimensions

Moving Coil Measuring Range		Moving Iron Measuring Range	
6-60A	C=67mm	0-30A	C=64mm
>60A	C=78mm	>30A	C=67mm

Max. panel thickness = 40mm

D	A	B
48 x 48	45 x 45	4
72 x 72	68 x 68	4
96 x 96	92 x 92	4
144 x 144	135 x 135	4





DIN16257 symbol meaning for calibration position

Vertical

Horizontal

Inclined 60°

Inclination of dial surface.

Required orientation must always be stated when ordering if other than vertical mounting is required.

Moving Coil DC Ammeters and Voltmeters

Moving coil meters are suitable for all DC systems. The linear scale is calibrated down to zero and the accuracy maintained down to 10%. High currents are measured with separate shunts and suitably scaled indicators. Suppressed, centre and offset zero models are available.

Specifications

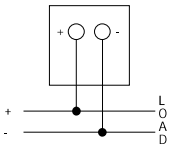
Accuracy:	Class 1.5
Ratings:	Ammeters: 100µA-25A 4/20mA suppressed zero 40A for model E242, E243 and E244 up to 100A
	Voltmeters: 50mV-600V 1/5V suppressed zero 50, 60, 75, 100, 150mV for use with shunts
Impedance:	Ammeters: 75mV internal shunt above 60mA
	Voltmeters: 100Ω/V above 1V

Product Codes

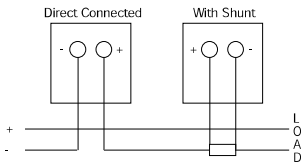
Bezel size mm	48	72	96	144
Scale length mm	42	65	94	145
Product codes				
Ammeters	E242-89A	E243-01A	E244-01A	E246-01A
Ammeters suppressed zero	E242-89R	E243-01R	E244-01R	E246-01R
Voltmeters	E242-89V	E243-01V	E244-01V	E246-01V
Voltmeters suppressed zero	E242-89S	E243-01S	E244-01S	E246-01S

Connections

DC Voltmeter



DC Ammeter



Moving Coil Rectified AC Ammeters and Voltmeters

For high frequency or linear full scale AC measurements, these instruments measure average values of sinusoidal waveforms and are scaled in RMS values. The high quality silicon bridge rectifier gives a linear scale down to near zero, where some compression occurs.

Specifications

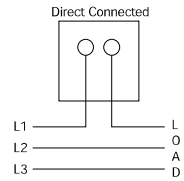
Accuracy:	1.5% ES
Ratings:	Ammeters: 250µA-1A AC Over 1A via CTs
Voltmeters:	15 - 600V AC direct connected. models available for use with VTs
Frequency:	50/60Hz, (Single frequencies 25Hz - 3kHz on request)

Product Codes

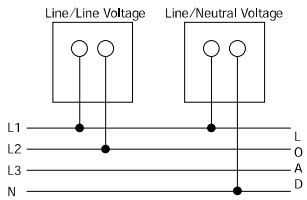
Bezel size mm	48	72	96	144
Scale length mm	42	65	94	145
Product codes				
Ammeters	E242-89B	E243-01B	E244-01B	E246-01B
Voltmeters	E242-89W	E243-01W	E244-01W	E246-01W

Connections

AC Ammeter



AC Voltmeter



Process Indicators

Meters are used to check process functions locally or remotely at centralised controls. These moving coil instruments offer a wide variety of electrical and mechanical readouts and are operated by transducer, tachogenerator, thermocouple, resistance bulb or other DC analogue signals. Suppressed, centre and offset zero models are available on request.

Specifications

Accuracy:	Class 1.5
Ratings:	1, 2, 5, 10, 20mA 4/20mA suppressed zero

Product Codes

Bezel size mm	48	72	96	144
Scale length mm	42	65	94	145
Product codes				
AC current	E242-89A	E243-01A	E244-01A	E246-01A
AC voltage	E242-89V	E243-01V	E244-01V	E246-01V
Phase angle	-	E243-014	E244-014	-
Watts	-	E243-015	E244-015	-
VAr	-	E243-016	E244-016	-
VA	-	E243-017	E244-017	-

Connections